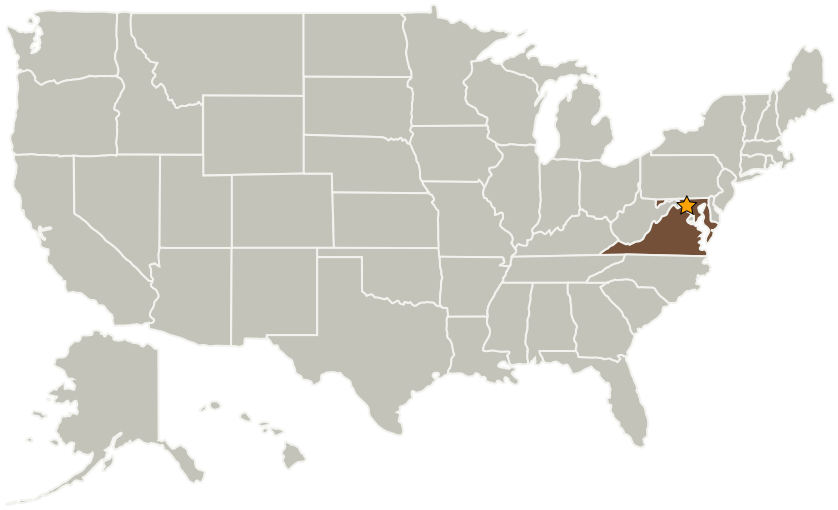
Micro-Slit Collimators for X-ray/Gamma-ray Imaging, Phase II

Completed Technology Project (2004 - 2006)

Project Introduction

Building on the success of our Phase I efforts, Mikro Systems, Inc. (MSI) proposes to advance the state-of-the-art in high resolution, high-aspect-ratio X-ray/gamma-ray collimator fabrication by reducing slit pitch by a factor of ~2, from 35 microns to 20 microns, using an innovative hybrid micro-machining technology. Fine grids having high-aspect-ratio (>50:1) and made from dense materials are the enabling components for solar and astrophysical imaging missions requiring high angular and/or spectral resolution at X-ray/gamma-ray energies. Instruments for these missions are severely constrained by size and mass considerations, and any technology that allows a reduction of size and/or mass without reducing image quality would contribute significantly to NASA's ongoing instrumentation development. Angular resolution is a function of the grid-pitch and distance between grids in a bi-grid collimator. Consequently, this advance in technology will have a significant effect on the angular resolution and/or instrument length and mass of grid-based optics required for x-ray and gamma-ray imaging in space. In Phase I, MSI demonstrated the technical feasibility of producing collimator grids with pitch as fine as 16 microns.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Goddard Space Flight Center (GSFC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland
Mikro Systems, Inc.	Supporting Organization	Industry	Charlottesville, Virginia

Primary U.S. Work Locations	
Maryland	Virginia

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.1 Detectors and Focal Planes